

Essential Nursing Competencies and Curricula Guidelines for Genetics and Genomics

**Established by Consensus Panel
September 21-22, 2005**

Preamble

Genomics is a central science for all nursing practice because essentially all diseases and conditions have a genetic or genomic component. Healthcare for all persons will increasingly include genetic and genomic information along the pathways of prevention, screening, diagnostics, prognostics, selection of treatment, and monitoring of treatment effectiveness.

The essential competencies were developed by an independent panel of nurses leaders from clinical, research, and academic settings whose goal was to establish the minimum basis by which to prepare the nursing workforce to deliver competent genetic and genomic focused nursing care. These competencies are not intended to replace or recreate existing standards of practice but are intended to incorporate the genetic and genomic perspective into all nursing education and practice.

The competencies were developed on the basis of:

- The results of a review of peer-reviewed published work reporting practice-based genetic and genomic competencies, guidelines, and recommendations.
- Input from nurse representatives to the National Coalition for Health Professional Education in Genetics (NCHPEG) in January, 2005.
- Public comment from the nursing community at large.
- Statements from conference attendees during open comment periods during a two day meeting of key stakeholders held September 21 and 22, 2005.

The competencies are based on the state of the evidence available at the time they were developed and reflect the **MINIMAL** amount of genetic and genomic competency expected by every nurse. These competencies reflect a consensus and are **NOT** from any Federal Agency or single Nursing Organization and are applicable to the practice of all registered nurses regardless of academic preparation, practice setting, role, or specialty.

The Nursing Organizations that have endorsed the competencies agree with the content and support and promote initiatives within their own organization to implement the competencies.

Endorsing Organizations: To be included at a later date

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Background:

Genetic and genomic science is redefining the understanding of the continuum of human health and illness. Therefore, recognition of genomics as a central science for health professional knowledge is essential. Because essentially all diseases and conditions have a genetic or genomic component, options for care for all persons will increasingly include genetic and genomic information along the pathways of prevention, screening, diagnostics, prognostics, selection of treatment, and monitoring of treatment effectiveness. The clinical application of genetic and genomic knowledge has major implications for the entire nursing profession regardless of academic preparation, role or practice setting.

The public will increasingly expect that the registered nurse (RN) will use genetic and genomic information and technology when providing care. These expectations have direct implications for RN preparatory curricula, as well as for the 2.5 million practicing nurses. The rate of progress for applying a genomic approach throughout the continuum of care depends not only on technologic advances, but also on nursing expertise. In its report on genetics and nursing in 2000, an expert Health Resources and Services Administration (HRSA) panel emphasized the importance of integrating genetics content into nursing curricula in order to provide an adequately prepared nursing workforce now and for the future¹. To care for persons/families/communities and/or populations throughout the lifespan, the registered nurse will need to demonstrate proficiency with incorporating genetic and genomic information into their practice. For example:

- understand the genetic and genomic basis of health and/or an illness for which the person is seeking care and the variables that impact their response
- recognize a newborn at risk for morbidity or mortality resulting from genetic metabolism errors
- identify an asymptomatic adolescent who is at high risk for hereditary colon cancer
- identify a couple at risk for having a child with a genetic condition
- guide interventions for the prevention of cardiovascular disease in young adults
- facilitate drug selection or dosage in treatment of an adult with cancer based on molecular markers
- promote informed consent that includes the risks, benefits and limitations of participation in genetic research
- assist anyone having questions about genetic and genomic information or services
- identify Caucasians of northern European descent (a population at risk for hemochromatosis) who have joint disease, severe and continuing fatigue, heart disease, elevated liver enzymes, impotence, and diabetes, because they are candidates for *HFE* genetic testing.

Purpose:

The primary purpose of this document is to define essential genetic and genomic competencies for all registered nurses. This document is intended to guide nurse educators in the design and implementation of learning experiences that help students/learners/practicing nurses achieve these genetic and genomic competencies. These competencies are not intended to replace or recreate existing standards of practice but are intended to incorporate the genetic and genomic

perspective into all nursing education and practice. The goal is to prepare the nursing workforce to deliver competent genetic and genomic focused nursing care.

Definitions:

Genetics – study of individual genes and their impact on relatively rare single gene disorders²

Genomics – study of all the genes in the human genome together, including their interactions with each other, the environment, and the influence of other psychosocial and cultural factors²

These two definitions remain a work in progress because the new knowledge produced by genome research will create an ongoing need to assess and revise our understanding of the influence of genetic and genomic factors for health outcomes. For the purpose of this document, both genetic and genomic information will be used as the context for defining required competencies.

Clients – Recipients of healthcare may include persons, families, communities, and/or populations from any race, ethnicity/ancestry, culture or religious background. The term clients will be used throughout the document to reflect the focus of nursing care.

Services – The delivery of genetic and genomic healthcare.

Resources – A collection of genetic and genomic tools and sites for healthcare referrals for delivery of nursing care.

Technology – The use of tools and/or machines to perform tasks. In this case the identification and assessment of genetic and genomic information (e.g. the use of microarray technology to assess the genetic features of a specific tumor).

Pedigree – A graphic illustration of a family health history using standardized symbols³.

Applicability:

The genetic and genomic competencies are integral to the practice of all registered nurses regardless of academic preparation, practice setting, role, or specialty.

History of Development:

Resource/Reference Documents – The Steering Committee identified, reviewed, analyzed, and compared competencies recommended in existing published and peer reviewed documents⁴⁻¹². A pre-publication manuscript by K. Greco¹³ reported on a qualitative analysis of published competency recommendations, including many of the above documents^{4, 5, 8, 9}. In addition, a competence-based education framework developed in the United Kingdom was used as a resource document¹⁴. Analysis of these documents and resources identified fundamental genetic and genomic competencies applicable for all registered nurses. A summary of available resources are provided in Appendix A.

Competency Development – Based on the review of earlier peer-reviewed published work reporting practice-based genetic and genomic competencies, guidelines, and recommendations, a group of nurse leaders from clinical, research, and academic settings developed these proposed competencies. The proposed competencies were approved by a steering committee of federal, academic and national leaders in nursing. In addition, these competencies were reviewed by nurse representatives to the National Coalition for Health Professional Education in Genetics (NCHPEG) in 2005 with subsequent revision to integrate their comments. To assist the development process, public comments, especially from the nursing community, were solicited.

Process of Consensus

Phase I The Steering Committee reviewed and provided comments on the preliminary document. This revised draft document was shared with nursing representatives attending the National Coalition for Health Professional Education in Genetics Meeting (January 2005) to further define and structure these recommended essential nursing competencies in genetics and genomics.

Phase II Additional review of the revised essentials document commenced with the posting for public comment at <http://NursingWorld.org/practice> and announcement to the American Nurses Association (ANA) and its constituent members and organizational affiliates, the Nursing Organizations Alliance, and other nursing organizations. All comments were carefully considered and appropriate revisions incorporated as indicated. Endorsement of the final document by these organizations will be requested by March 2006.

Phase III A meeting of key stakeholders was held September 21 & 22, 2005 to establish consensus on the final competency document by key stakeholders. See Appendix B for the list of meeting participants. Strategies to integrate genetic and genomic information into education and practice were proposed and then discussed, with identification of steps to include in an action plan for integration of recommended genetic and genomic nursing competencies content into curricula, the NCLEX examination, specialty certification processes, and accreditation programs.

Essential Competencies

Professional Responsibilities

All registered nurses are expected to engage in professional role activities that are consistent with the Nursing: Scope and Standards of Practice, 2004 by the American Nurses Association¹⁵. In addition, competent nursing practice now requires the incorporation of genetic and genomic knowledge and skills in order to:

- Recognize when one's own attitudes and values related to genetic and genomic science may affect care provided to clients
- Advocate for clients access to desired genetic/genomic services and/or resources
- Examine competency of practice on a regular basis, identifying areas of strength, as well as areas in which professional development related to genetics and genomics would be beneficial
- Incorporate genetic and genomic technologies and information into registered nurse practice
- Demonstrate in practice the importance of tailoring genetic and genomic information and services to clients based on their culture, religion, knowledge level, literacy and preferred language
- Advocate for the rights of all clients for autonomous, informed genetic and genomic-related decision-making and voluntary action

Professional Practice Domain

Nursing Assessment applying/integrating genetic and genomic knowledge

The registered nurse:

- Demonstrates an understanding of the relationship of genetics/genomics to health, prevention, screening, diagnostics, prognostics, selection of treatment, and monitoring of treatment effectiveness
- Demonstrates ability to elicit a minimum of three generation family health history information
- Constructs pedigree from collected family history information using standardized symbols and terminology
- Collects personal, health and developmental histories that consider genetic, environmental, and genomic influences and risks
- Conducts comprehensive health and physical assessments that incorporates knowledge about genetic, environmental, and genomic influences and risk factors
- Critically analyzes the history and physical assessment findings for genetic, environmental, and genomic influences and risk factors
- Assesses clients' knowledge, perceptions, and responses to genetic and genomic information
- Develops plan of care that incorporates genetic and genomic assessment information

Identification

The registered nurse:

- Identifies clients who may benefit from specific genetic and genomic information and/or services based on assessment data
- Identifies credible, accurate, appropriate and current genetic and genomic information, resources, services and/or technologies specific to given clients
- Identifies ethical, ethnic/ancestral, cultural, religious, legal, fiscal, and societal issues related to genetic and genomic information and technologies
- Defines issues that undermine the rights of all clients for autonomous, informed genetic and genomic-related decision-making and voluntary action

Referral Activities

The registered nurse:

- Facilitates referrals for specialized genetic and genomic services for clients as needed

Provision of Education, Care & Support

The registered nurse:

- Provides clients with interpretation of selective genetic and genomic information or services
- Provides clients with genetic and genomic credible, accurate, appropriate and current information, resources, services and/or technologies that facilitate decision-making
- Uses health promotion/disease prevention practices that:
 - Considers genetic and genomic influences on risk with personal and environmental risk factors
 - Incorporates knowledge of genetic and/or genomic risk factors (e.g., a client with a genetic predisposition for high cholesterol that can benefit from a change in lifestyle that will decrease the likelihood that the genetic risk will be expressed)
- Uses genetic and genomic-based interventions and information to improve clients' outcomes
- Collaborates with healthcare providers in providing genetic and genomic health care
- Collaborates with insurance providers/payers to facilitate reimbursement for genetic and genomic health care services
- Performs interventions/treatments appropriate to clients' genetic and genomic health care needs
- Evaluates impact and effectiveness of genetic and genomic technology, information, interventions, and treatments on clients' outcome

Essential Competencies

Strategies:

Practice and curriculum change requires the commitment of nursing leaders and academic faculty to develop a long-term plan to incorporate genetic and genomic information to improve the public's health. Faculty and practicing nurses must be supported to attend continuing education or academic courses to update their genetic and genomic knowledge. Collaboration with other disciplines is necessary to provide a strong foundation of knowledge of basic human genetics and current applications to practice.

NCLEX – Participate in the NCLEX test development process to ensure inclusion of test items addressing genetic and genomic knowledge. Continue to include and participate in development of test items assessing integration of genetic and genomic knowledge. Work with the American Hospital Association and other regulatory agencies/organizations to incorporate genetics and genomics practice content on assessments of quality which will also influence NCLEX content.

Certification – All certification exams should include test items measuring the knowledge of genetic and genomic information pertinent to the specialty for which a registered nurse is being certified.

Practicing Nurses – Practicing nurses should be encouraged to pursue genetic and genomic continuing education. Consider establishing a United States National Genetics Education and Development Center modeled after the United Kingdom initiative which can serve as the central resource for genetics and genomic education initiatives.

<http://www.geneticseducation.nhs.uk>

Accreditation of Programs – The standards for accreditation should evaluate whether the curriculum is designed to meet the essential core genetic and genomic competencies.

<http://www.nlnac.org/manuals/NLNACManual2004.pdf>

Curricula – Each nursing curriculum preparing registered nurses for practice (at any and all levels) should include genetic and genomic learning experiences sufficient for all registered nurses to be proficient in the essential competencies. This can be accomplished by incorporating genetics and genomics learning experiences into existing classes. Refer to Appendix A for resources useful to faculty.

Incorporating Competencies, Content, and Teaching Strategies in the Curriculum:

Today's nursing curriculum is dense and integrating new information is a challenge. Since genetic and genomic information is integral and critical to all areas of nursing practice, curricula must prepare graduates with this information¹⁶. Nursing faculty from 171 nursing schools contributed to the development of a checklist which was created to help faculty integrate genetics content into nursing curricula¹⁷. An important initial strategy noted in the checklist is to determine what content is already being taught in pre-nursing and nursing courses. Once content gaps are identified, many curriculum change strategies can be used to add genetic and genomic content to instructional resources¹⁸. Potential solutions include incorporating genetics and genomics as a central science including the following:

- add genetic and genomic content to existing lectures,
- integrate assignments incorporating genetic and genomic knowledge and test questions to existing courses,
- include genetic and genomic-focused objectives to all nursing courses,
- create a curriculum thread focused on genetics and genomics,
- develop an elective genetics and genomics nursing course that can be transitioned into a required course, and
- collaborate with interdisciplinary colleagues to design courses and curricula.

Outcomes associated with some of the curriculum options listed above have already been published¹⁹. A theory based approach to integrating genetics into one school's nursing curriculum is well described by Horner et al²⁰. Integrative approaches in associate and baccalaureate programs have been published by Danz, 2004, Zamerowski, 2000, and Read et al., 2004^{21, 22, 23}. Development of a single genetic and genomic nursing course incorporated into the curriculum has also been described²⁴. The ability of faculty to effectively incorporate genetics and genomics content into the nursing curricula hinges on the availability of faculty with education or expertise in genetics and genomics²⁵. Outcomes associated with faculty training initiatives addressing this need (including summer institutes and a web based program^{26, 27, 28}) have also been described.

References Cited in Text

1. Expert Panel Report on Genetics and Nursing. (2000). Implications for Education and Practice. Washington, D.C. BHP00177. Available from: <http://www.ask.hrsa.gov/HRS00296> HRSA Publication Catalog.
2. Guttmacher, A., & Collins, F. (2002). Genomic medicine: A primer. *NEJM*, 347, 1512-1520.
3. Bennett, R.L., Steinhaus, K.A., Uhrich, S.B., O'Sullivan, C.K., Resta, R.G., Locher-Doyle, D, Markel. D.S., Vincent, V., Hamanishi, J. (1995). Recommendations for Standardized Human Pedigree Nomenclature. *American Journal of Human Genetics*, 56, 745-752.
4. Centers for Disease Control and Prevention (CDC) (2001). *Genomic competencies for all public health professionals* [online]. Available: <http://www.cdc.gov/genomics/training/competencies/comps.htm>
5. International Society of Nurses in Genetics. (1998). *Statement on the scope and standards of genetics clinical nursing practice*. Washington D.C.: American Nurses Association. Available from: 1-770-442-8633 ext. 295; <http://www.nursesbooks.org>
6. International Society of Nurses in Genetics. (in press, 2005). *Genetics Nursing: Scope and Standards of Practice*. Washington D.C.: American Nurses Association.
7. Jenkins, J. F., Dimond, E., & Steinberg, S. (2001). Preparing for the future through genetics nursing education. *Journal of Nursing Scholarship*, 33(2), 191-5.
8. Jenkins, J. F., Prows, C., Dimond, E., Monsen, R., & Williams, J. (2001). Recommendations for educating nurses in genetics. *Journal of Professional Nursing*, 17(6), 283-90.
9. National Coalition for Health Professional Education in Genetics (NCHPEG) (2000). *Core competencies in genetics essential for all health-care professionals*. Accessed 8/1/05 from <http://www.nchpeg.org/>
10. American Association of Colleges of Nursing (1996). *The Essentials of Masters Education for Advanced Practice Nursing*. Washington, D.C.
11. American Association of Colleges of Nursing (1998). *The Essentials of Baccalaureate Education for Professional Education*. Washington, D.C.
12. American Association of Colleges of Nursing (2001). *Indicators of Quality in Research-focused Doctoral Programs in Nursing*. Washington, D.C.

13. Greco, K. E. & Salvesson, C. (in review process) An evidence-based qualitative analysis identifying fundamental undergraduate nursing competencies in genetics. (submitted to *Journal of Nursing Education* for publication).
14. Kirk M, McDonald K, Longley M, Anstey S et al. (2003). *Fit for Practice in the Genetics Era: A competence based education framework for nurses, midwives and health visitors - Final Report*. Pontypridd: University of Glamorgan
(<http://www.glam.ac.uk/socs/research/gpu/FinalReport.pdf>)
15. American Nurses Association. (2004). *Nursing: Scope and Standards of Practice*. Washington, DC: American Nurses Association.
16. Williams, J.K. (2002). Education for genetics and nursing practice. AACN Clinical Issues: Current issues in genetics. 13(4), 492-500.
17. Hetteberg, C., & Prows, C. A. (2004). A checklist to assist in the integration of genetics into nursing curricula. *Nursing Outlook*, 52(2), 85-88.
18. Williams, J.K., Tripp-Reimer, T., Schutte, D., Barnette, J.J. (2004). Advancing genetic nursing knowledge. *Nursing Outlook*, 52(2): 73-79.
19. Lea, D.H., Monsen, R.B. (2003). Preparing nurses for a 21st century role in genomics-based health care. *Nursing Education Perspectives*, 24(2): 75-80.
20. Horner, S. D., Abel, E., Taylor, K., & Sands, D. (2004). Using theory to guide the diffusion of genetics content in nursing curricula. *Nursing Outlook*, 52(2), 80-84.
21. Danz, S. (2004). Integrating genetics content in nursing education at Delaware Technical and Community College, Jack F. Owens campus. Doctoral dissertation, University of Delaware, 2004.
22. Zamerowski, S.T. (2000). A model for integrating genetics into nursing education. *Nursing Health Care Perspectives*, 21(6). 298-304.
23. Read, C.Y., Dylis, A.M., Mott, S.R., Fairchild, N.J. (2004). Promoting integration of genetics core competencies into entry-level nursing curricula. *Journal of Nursing Education*, 43(8): 376-380.
24. Horner, S.D. (2004). A genetics course for advanced clinical nursing practice. *Clinical Nurse Specialist*. 18(4): 194-199.
25. Prows,C.A., Glass, M., Nicol, M.J., Skirton, H., Williams, J. (2005). Genomics in nursing education. *Journal of Nursing Scholarship*, 37(3):196-202
26. Whitt, K.J. (2005). Experiences from the National Institute of Nursing Research: Summer Genetics Institute 2004. *Policy, Politics, and Nursing Practice*, 6(1):15-16.

27. Prows, C.A., Hetteberg, C., Johnson, N., Latta, K. Lovell, A., Saal, H.M., Warren, N.S. (2003). Outcomes of a genetics education program for nursing faculty. *Nursing Education Perspectives*, 24(2):81-85.
28. Prows, C.A., Hetteberg, C., Hopkin, R.J., Latta, K.K., Powers, S.M. (2004). Development of a Web-based genetics institute for a nursing audience. *Journal of Continuing Education in Nursing*, 35(5):223-231.

Appendix A: Resources

Clinical Genetic Resources

Resource	Contact	Description
GeneTests	http://www.genetests.org/	Information for health professionals about hundreds of genetic tests and the laboratories performing those tests
Human Genome Epidemiology Network (HuGENet)	http://www.cdc.gov/genomics/hugenet/default.htm	Network for sharing population-based human genome epidemiologic information
INFOGENETICS	http://www.infogenetics.org/	Clinical practice tools
National Birth Defects Prevention Network	http://www.nbdpn.org	Network of birth defect care providers
National Newborn Screening & Genetics Resource Center	http://www.genes-r-us.uthscsa.edu/	National Newborn Screening & Genetics Resource Center
Online Mendelian Inheritance in Man (OMIM)	http://www.ncbi.nlm.nih.gov/Omim/	Information about human genes and disease

Support and Advocacy Groups

Resource	Contact	Description
Coalition for Genetic Fairness	http://www.geneticfairness.org/	Advocacy group for federal legislation regarding genetics discrimination
Family Village	http://www.familyvillage.wisc.edu/index.html	Disability-related resources
The Genetic Alliance	http://www.geneticalliance.org/	Wide array of genetic-related information
The Genome Action Coalition	http://www.tgac.org	Advocacy group for federal genetic legislation
National Organization for Rare Disorders	http://www.rarediseases.org/	Wide array of genetic-related information

Health Professional Genetic Resources

Resource	Contact	Description
Clinical Genetics: A Self Study for Health Care Providers	http://www.vh.org/pediatric/provider/pediatrics/ClinicalGenetics/Contents.html	Electronic textbook from Virtual Children's Hospital
Foundation for Genetic Education and Counseling	http://www.fgec.org	Genetics and common diseases, especially psychiatric disorders
Genetics and Your Practice Online	http://www.marchofdimmes.com/gyponline/index.bm2	A practical "how-to" site on clinical genetics from the March of Dimes
Genetics in Clinical Practice: A Team Approach	http://iml.dartmouth.edu/education/cme/Genetics/	Virtual Genetics Clinic
Genetics in Primary Care	http://genes-r-us.uthscsa.edu/resources/genetics/primary_care.htm	Training program curriculum materials
Genetics in Psychology	http://www.apa.org/science/genetics/homepage.html	The American Psychological Association's site about genetics
Genetics Program for Nursing Faculty	http://www.gpnf.org	Links to genetics resources of particular interest to nurses
Genetics: Educational Information	http://www.faseb.org/genetics/careers.htm	Medical school courses in genetics, some with syllabi
Information for Genetics Professionals	http://www.kumc.edu/gec/geneinfo.html	Educational, clinical, and research resources
National Coalition for Health Professional Education in Genetics	http://www.nchpeg.org/	Core competencies in genetics and reviews of education programs

IRB Related Resources

Resource	Contact	Description
My Very Own Medicine: What Must I know? Information Policy for Pharmacogenetics. Public Health Genetics Unit, National Health Service, UK - D. Melzer et al. (2003).	http://www.phgu.org.uk/about_phgu/pharmacogenetics.html	General information and background, looking ahead to future needs, including guidance for IRBs
New York State Task Force on Life and Law: Genetic Testing and Screening in the Age of Genomic Medicine (2001).	http://www.health.state.ny.us/nysdoh/taskforce/screening.htm	Includes general and state specific information in a bulleted report that is relatively easy to scan by topic
Office for Human Research Protections: Protecting Human Research Subjects Institutional Review Board Guidebook, Chapter H: Human Genetic Research (1993).	http://www.hhs.gov/ohrp/irb/irb_chapter5ii.htm#h12	Discusses many issues that continue to challenge IRBs and investigators (and policy makers) today
Pharmacogenetics: Ethical Issues. Nuffield Council on Bioethics (2003).	http://www.nuffieldbioethics.org/publications/pp_0000000018.asp	Includes a section discussing the use of pharmacogenetics in clinical trials

Search Engines

Resource	Contact	Description
Centers for Disease Control: Genomics and Disease Prevention Information System	http://apps.nccd.cdc.gov/genomics/GDPquerytool/searchbygene.asp	Provides access to information and resources for guiding public health research, policy, and practice on using genetic information to improve health and prevent disease. Includes core competencies for public health genetics.
Georgetown University: National Information Resource on Ethics & Human Genetics	http://www.georgetown.edu/research/nrcbl/nirehg/index.htm	Search engine for literature on specific issues
National Newborn Screening and Genetics Resource Center: Genetic Education Materials Database	http://www.gemdatabase.org/GEMDatabase/index.asp	Search engine for clinical issues

Genetics Resources on the Web (GROW)	http://www.geneticsresources.org/	Provides health professionals and the public with high quality information related to human genetics, with a particular focus on genetic medicine and health
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Genetics Instructional Resources

Resource	Contact	Description
GEPN curriculum resources	www.gepn.cchmc.org	Sample genetics nursing course syllabi; links to instructional resources used in GSI and WBGI
Self-paced genetics modules based on NCHPEG competencies	www.gepn.cchmc.org	Designed for practicing nurses; however, each module could be assigned to students to learn a particular topic. Access and use is free.
Practice-Based Genetics Curricula for Nurse Educators	www.fbr.org	Bound instructional modules with accompanying CD or PowerPoint presentations
Genetics and Your Practice Online	http://www.marchofdimes.com/gyponline/index.bm2	Online modules designed for exploration of a topic rather than sequential presentation of material. Many excellent fact sheets & sample clinical forms
Genetics in Clinical Practice – A Team Approach	http://www.acmg.net/resources/cd-rom-01/intro.asp	Interactive CD-ROM, virtual genetics clinic with case scenarios and case discussions. Target audience is primary care professionals.

Dolan DNA Learning Center	http://www.dnalc.org/	Interactive, multimedia genetics education resources
National Cancer Institute's CancerNet	http://www.cancer.gov/cancerinfo/prevention-genetics-causes	Authoritative information about cancer genetics
National Coalition of Health Care Professionals (NCHPEG) education resources	http://www.nchpeg.org	Descriptions of available instructional resources, courses, institutes. All have been submitted by developers and some have accompanying peer reviews
Kansas Genetics Education Center	http://www.kumc.edu/gec/	An ever growing list of available resources
Centre for Genetics Education	http://www.genetics.com.au/	Education and service resources for patients and professionals
GenEd Project	http://www.medicine.man.ac.uk/GenEd/	Education and research links related to European aspects of genetic services
Centre for Education in Medical Genetics	http://www.bwhct.nhs.uk/cemg/index.htm	Develop, provide and evaluate genetics education opportunities and resources
Six Weeks to Genomic Awareness	http://www.genomicawareness.org/	Webcast of 12 segments of genomic topics
Physician's Database Query (PDQ®)	http://www.cancer.gov/cancerinfo/pdq/genetics	PDQ® cancer information summaries in genetics

Organizational Resources to Guide Nursing Practice

Organization		Material
American Nurses Association	http://www.nursingworld.org	<ul style="list-style-type: none"> • Code of Ethics for Nurses • Policy statements on genetics and nursing: Cloning and therapeutic and reproductive application of genetics • Position statements on human cloning: human rights, discriminations and privacy and confidentiality
American Society of Clinical Oncology	http://www.asco.org	<ul style="list-style-type: none"> • Policy Statement Update: Genetic testing for cancer susceptibility
Association of Women's Health, Obstetric and Neonatal Nurses	http://www.awhonn.org	<ul style="list-style-type: none"> • Position Statement: The role of the registered nurse as related to genetic testing
Department of Health and Human Services	http://www.os.dhhs.gov/	<ul style="list-style-type: none"> • Report of the expert panel on genetics and nursing: Implications for education and practice
International Society of Nurses in Genetics, Inc.	http://www.isong.org	<ul style="list-style-type: none"> • Statement on the scope and standards of genetics clinical nursing practice • Position statement: Access to genomic healthcare: The role of the nurse • Position statement. Privacy and confidentiality of genetic information: The role of the nurse • Position statement: Genetic counseling for vulnerable populations: The role of nursing • Position statement: Informed decision-making and consent: The role of nursing
National Coalition of Health Care Professionals	http://www.nchpeg.org	<ul style="list-style-type: none"> • Recommendations of core competencies in genetics for all health professionals

Oncology Nursing Society	http://www.ons.org	<ul style="list-style-type: none"> • Position statement: The role of the oncology nurse in cancer genetic counseling • Position statement: Cancer predisposition genetic testing and risk assessment counseling
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Professional Genetic Education Resources

Organization	Contact Information	Program/Resources
Academic-Nursing		
Columbia University	Columbia University School of Nursing 630 West 168th Street New York, NY 10032 (212) 305-5756 http://www.cumc.columbia.edu/dept/nursing/programs/cg.html	Masters degree program with a clinical genetics sub-specialty
University of Iowa	University of Iowa Iowa City, IA 52242 319-335-7046 Attention: Janet Williams, PhD, RN http://www.uiowa.edu	Masters and PhD degree programs in genetic nursing
University of Pittsburgh	University of Pittsburgh School of Nursing 239 Victoria Building Pittsburgh, PA 15261 412-624-4586 or 1-888-747-0794 http://www.pitt.edu/~nursing/academicprograms/certificates/post_bacc_genetics.html and http://www.pitt.edu/~nursing/academicprograms/certificates/post_masters_cert_genetics.html	Post-Baccalaureate Certificate in Genetics Post-Master's Certificate in Health Care Genetics
University of California, San Francisco	University of California, San Francisco Department of Physiological Nursing 2 Koret Way, Suite N631 San Francisco, CA 94143-0610 415-476-0984 Attention: Mary B. Engler, PhD, RN, MS http://nurseweb.ucsf.edu/www/genomic.htm	Masters degree program in nursing genetics
University of Washington	University of Washington School of Nursing Box 357260 Seattle, WA 98195 206-221-2458 http://www.son.washington.edu/co/apgn	Masters degree program with a minor in genetics nursing

Continuing Education		
American Society of Clinical Oncology	1900 Duke Street Suite 200 Alexandria, VA 22314 703-299-0150 http://www.asco.org	Cancer Genetics and Cancer Predisposition Genetic Testing, 1st Edition-An ASCO Curriculum including binders and CD Rom slide set. ONCOSEP: Genetics-Tool for self-education and assessment in genetic testing, risk assessment, and specific areas of genetic disease.
Cincinnati Children's Hospital Medical Center	3333 Burnet Avenue Cincinnati, Ohio 45229-3039 513-636-4200 http://www.cincinnatichildrens.org/ed/clinical/gpnf	Genetics Education Program for Nurses-Web Based Genetics Institute and Genetics Education Program for Nursing Faculty
City of Hope National Medical Center and Beckman Research Institute	1500 E. Duarte Road Duarte, CA 91010-3000 800-423-7119 http://www.cityofhope.org	Intensive Course in Cancer Risk Assessment
Foundation for Blood Research	69 US Route 1 P.O. Box 190 Scarborough ME 04070-0190 207-883-4131 http://www.fbr.org	Practice-Based Genetics Curriculum For Nurse Educators
Fox Chase Cancer Center	333 Cottman Avenue Philadelphia, PA 19111-2497 215-728-2892 http://www.fccc.edu/nursing/education/	A Basic Course in Cancer Genetics: Familial Cancer Risk Assessment An Advanced Training for Nurses in Cancer Risk Counseling

International Society of Nurses in Genetics, Inc. (ISONG)	461 Cochran Road Box 246 Pittsburgh, PA 15228 412-344-1414 Email: isongHQ@msn.com http://www.isong.org	Annual Nursing and Genetic Education Meeting Statement on the Scope and Standards of Clinical Genetics Nursing Practice
National Institute of Nursing Research (NINR)	Summer Genetics Institute Division of Intramural Research National Institute of Nursing Research National Institutes of Health 31 Center Drive, 5B-13 Bethesda, MD 20892-2178 http://www.nih.gov/ninr/research/dir/sgi.html	Summer Genetics Institute
Oncology Nursing Society (ONS)	125 Enterprise Drive RIDC Park West Pittsburgh, PA 15275-1214 866-257-4ONS Email: customer.service@ons.org http://www.ons.org	Genetics Short Course for Oncology Nurses

Consumer Resources

Resource	Contact	Description
Building and Understanding Your Medical Family History	http://jamesline.com/patientsandvisitors/prevention/cancergenetics/	Information on collecting family health history and assessing cancer risk
The DNA Files	http://www.dnfiles.org/	A series of 14 one-hour public radio documentaries and related information
Dolan DNA Learning Center	http://vector.cshl.org/	A variety of educational resources, including an interactive DNA timeline
Foundations of Classical Genetics	http://www.esp.org/foundations/genetics/classical	Complete versions of classic genetics works written between 350 A.D. and 1932

Generational Health	http://www.generation.alhealth.com/	Tool to help trace a family's medical history and provide information on common diseases
Genetic Science Learning Center	http://gslc.genetics.uta.h.edu/	Basic genetics, genetic disorders, genetics in society, and several thematic units
Genetics and Rare Diseases Information Center	http://www.genome.gov/10000409	Information service for the general public, including patients and their families, health care professionals and biomedical researchers
Ethics and Genetic Testing for Nurses	http://www.nursing.uiowa.edu/areas/parentchild/cdrom.htm	CDROM-3 module on ethics, on genetic testing, case studies
Genetics Education Center	http://www.kumc.edu/gec/	Material for educators
Genetics Home Reference- National Library of Medicine	http://ghr.nlm.nih.gov/	Consumer information about genetic conditions and the genes responsible for those conditions
The Human Genome Project: Exploring Our Molecular Selves	http://www.genome.gov/Pages/EducationKit/	Video about Human Genome Project, timeline about genetics, talking glossary, classroom activities, 3-D animation of cell
MendelWeb	http://www.mendelweb.org/	Mendel's papers in English and German and related materials
National Society for Genetic Counselors- Family History	http://www.nsgc.org/consumer/familytree/index.asp	Information on collecting family health history
The New Genetics: A Resource for Students and Teachers	http://www4.umdj.edu/camlbweb/teachgen.html	Links to genetic education resources

Understanding Gene Testing	http://www.cancer.gov/cancertopics/UnderstandingCancer/genetesting	Primer on genetic testing
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ELSI, Policy and Legislation

Resource	Contact	Description
American Academy of Pediatrics: Ethical Issues With Genetic Testing in Pediatrics	http://pediatrics.aappublications.org/cgi/Description/full/107/6/1451	Recommendations on newborn screening and genetic testing in children
Bioethics Resources on the Web	http://www.nih.gov/sigs/bioethics/	Links to bioethics resources
bioethics.net	http://www.bioethics.net/genetics/genetics.php	Links to articles on bioethics and genetics
DNA Patent Database	http://dnapatents.georgetown.edu	Searchable database of U.S. DNA-based patents issued by the USPTO
The Council for Responsible Genetics	http://www.gene-watch.org/	Information on the social, ethical and environmental implications of genetic technologies
Ethical, Legal, & Social Issues	http://www.ornl.gov/hgmis/elsi/elsi.html http://www.genome.gov/10001754	Information, articles, and links on a wide range of issues
Foundation for Genetic Medicine, Inc.	http://www.geneticmedicine.org/	Information on the science of genetic medicine, genetic and genomic research, and ethical, legal and social dimensions and implications
Genetics & Ethics	http://www.genethics.ca/index.html	Information on the social, ethical and policy issues associated with genetic and genomic knowledge and technology

Genetics and the Law	http://www.genelaw.info/	A searchable online clearinghouse of information on emerging legal developments in human genetics
Genetics and Public Policy Center	www.dnapolicy.org	Information on genetic technologies and genetic policies for the public, media and policymakers
Genome Technology and Reproduction: Values and Public Policy and The Communities of Color & Genetics Policy Project	http://www.sph.umich.edu/genpolicy/	Two subprojects combined to form a five year project designed to provide policy recommendations based on public perceptions and responses to the explosion of genetic information and technology.
HumGen	http://www.humgen.umontreal.ca/en/	Access to a comprehensive international database on the legal, social and ethical aspects of human genetics
National Information Resources on Ethics & Human Genetics	http://www.georgetown.edu/research/nrcbl/nirehg/index.htm	Links to resources on ethics and human genetics
NCSL- Genetic Technologies Project	http://www.ncsl.org/programs/health/genetics.htm	Status of legislative actions and access to policy briefs on genetic issues of concern to state legislators
The President's Council on Bioethics	http://www.bioethics.gov/	Information on current bioethical issues
Scope Note Series (Kennedy Institute of Ethics/ Georgetown University)	http://www.georgetown.edu/research/nrcbl/nirehg/scope.htm	Information on various aspects of genetics and ethics
THOMAS Legislative Information on the Internet	http://thomas.loc.gov/	Searchable database of U.S. legislation

Your Genes Your Choices	http://ehrweb.aaas.org/ehr/books/index.html	Describes the Human Genome Project, the science behind it, and the ethical, legal, and social issues that are raised by the project
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Genetics Professional Groups

Resource	Contact	Description
American Board of Genetic Counseling	http://www.faseb.org/genetics/abgc/abgcmenu.htm	Information about certification of genetic counselors
American Board of Medical Genetics	http://www.faseb.org/genetics/abmg/abmgmenu.htm	Information about medical genetic training programs and certification of geneticists
American College of Medical Genetics	http://www.acmg.net/	Information and policy statements about medical genetics
American Society for Human Genetics	http://www.ashg.org/	Information about human genetics
Genetics Nursing Credentialing Commission	http://www.geneticnurse.org	Information about credentialing of genetic nurses
Genetics Society of America	http://www.faseb.org/genetics/gsa/gsamenu.htm	Information about genetics
International Society of Nurses in Genetics	http://www.isong.org/	Information about genetics in nursing
National Society of Genetic Counselors	http://www.nsgc.org/	Information about genetic counseling
Society for the Study of Inborn Errors of Metabolism	http://www.ssiem.org/	Information about inborn errors of metabolism

United States Government Genetic Agencies

Resource	Contact	Description
Center for Disease Control and Prevention, Office of Genomics & Disease Prevention	http://www.cdc.gov/genomics/default.htm	Information about human genetic discoveries and how to use to improve health and prevent disease

Department of Energy	http://www.doe-genomics.org/	Multiple genetics educational resources
Genetic Modification Clinical Research Information System (GeMCRIS)	http://www.gemcris.org/nih.gov/	Access to an array of information about human gene transfer trials registered with the NIH
Health Resources and Services Administration- Genetics Services Branch	http://www.mchb.hrsa.gov/	Organization with mission to improve and expand access to quality healthcare for all
National Cancer Institute's CancerNet	http://www.cancer.gov/cancerinfo/prevention-genetics-causes	Authoritative information about cancer genetics
National Human Genome Research Institute	http://www.genome.gov	Research, health, policy, ethics, education, and training information and resources
National Institute of Environmental Health Sciences- Environmental Genome Project	http://www.niehs.nih.gov/envgenom/home.htm	Project to improve understanding of human genetic susceptibility to environmental exposures
National Institutes of Health Obesity Research	http://obesityresearch.nih.gov/	Information about NIH-supported research that seeks to identify genetic, behavioral, and environmental causes of obesity
National Institutes of Health	http://www.nih.gov/	Research, health, policy, ethics, education, and training information & resources
National Institute of Nursing Research- Summer Genetics Institute	http://fmp.cit.nih.gov/ninr/	Summer Genetics Institute program that is designed to provide training in molecular genetics for use in research and clinical practice

Office of Rare Diseases, National Institutes of Health	http://rarediseases.info.nih.gov/	Information on thousands of rare disorders
Secretary's Advisory Committee on Genetic Testing	http://www4.od.nih.gov/oba/SACGT.HTM	Policy issues regarding genetic testing (archival)
Secretary's Advisory Committee on Genetics, Health, and Society	http://www4.od.nih.gov/oba/sacghs.htm	Policy issues regarding the impact of genetic technologies on society

Family History Tools

Resource	Contact	Description
American Medical Association- Family History Tools	http://www.ama-assn.org/ama/pub/category/2380.html	Tools for gathering family history
Cyrillic	www.cyrillicsoftware.com	Pedigree drawing software
Pedigree Draw	http://www.pedigree-draw.com	Pedigree drawing software
Progeny	www.progeny2000.com	Pedigree drawing software
U.S. Surgeon General Family History Initiative “My Family Health Portrait”	http://www.hhs.gov/familyhistory/	Patient completed pedigree drawing software

Sites that Track or Report on What’s New in Genetics

Resource	Contact	Description
Genetics and Molecular Medicine (American Medical Association)	http://www.ama-assn.org/ama/pub/category/1799.html	Links to current articles and other resources
Genome News Network (The Center for the Advancement of Genomics)	http://www.genomeweb.com/network.org/main.shtml	Original articles and links
Science News Presented by BIO: Biotechnology Industry Organization	http://science.bio.org/genomics.news.html	Links to current articles

Risk Assessment

Resource	Contact	Description
Harvard Center for Cancer Prevention-Your Cancer Risk	http://www.yourcancer.risk.harvard.edu/	Personalized estimation of cancer risk and tips for prevention

National Cancer Institute- Breast Cancer Risk Assessment Tool	http://bcra.nci.nih.gov/brc/	Interactive tool to measure a woman's risk of invasive breast cancer
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Resource Genetic and Genomic Books and Monographs

Resource	Publisher	Description
Clinical Genetics in Nursing Practice 3 rd Edition (2005) By Felissa Lashley	Springer Publishing Company, Inc.	Nursing and genetics text
Nursing and 21 st Century Genetics: Leadership for Global Health (2004) Editors Suzanne Feetham, Janet Williams	International Council of Nurses http://www.icn.ch/books/hop.htm	The monograph is comprehensive in its coverage of genetics from diverse cultural and religious perspectives, it is applicable and appealing to nurses worldwide. Key issues covered include: leadership in genetic education, genetic nursing practice, nursing informatics and genetics health, genetic research in nursing and nursing leadership to address ethical challenges in genetics.
Genetics in Oncology Practice: Cancer Risk Assessment (2003) Editors Amy Strauss Tranin, Agnes Masny, Jean Jenkins	Oncology Nursing Press	A detailed overview of genetics and the implications for cancer nursing practice
The Genetics Revolution: Implications for Nurses (1997) By Felissa Lashley	American Nurses Association	The first nursing monograph to be published on the profession's responses to the opportunities and challenges of the Human Genome Project and the advances in gene research.

Applied Genetics in Healthcare (2005) By Heather Skirton, Christine Patch, Janet Williams	BIOS Scientific Publishers	Text for application of genetic and genomic principles by nurses who provide genetic and genomic health care as specialist practitioners and advanced practice nurses
Nursing Care in the Genomic Era: A Case Based Approach (2005) By Jean Jenkins, Dale Lea	Jones & Bartlett Publishers	Provides nurses with up-to-date and accessible information on core competencies in genetics, interwoven with stories that highlight a particular condition and the related biological, personal, and psychosocial issues.
Genetics in Clinical Practice: New Directions for Nursing and Health Care (1998) By Dale Lea and Jean Jenkins	Jones & Bartlett Publishers	Provides a unique, understandable approach to the emerging science of genetics
Genetic Nursing Portfolios: A New Model for the Profession (2005) Editor: Rita Black Monsen	American Nurses Association	Describes the development of the GNCC credentialing program. The book shows how to assemble and use a portfolio to verify competency in a specialty.
Statement on the Scope and Standards of Genetics Clinical Nursing Practice (1998) By International Society of Nurses in Genetics, Inc.	American Nurses Association	Scope and standards of practice for nurses in genetics

Genetics and the Perinatal and Women's Health Nurse (2001) By Judith Lewis	Association of Women's Health, Obstetric and Neonatal Nurses	This practice monograph provides nurses with the basic information they need to provide patients with accurate information about genetic screening and testing
Genetic Issues for Perinatal Nurses (2003) By Janet Williams, Dale Halsey Lea Editor Rita Reis Wiczorek	March of Dimes Birth Defects Foundation Education Services Dept	A nursing continuing education program that presents an update of genetics, principles of inheritance and ethical principles. Provides information on identification of actual or potential genetic conditions in the fetus, parent, or neonate.
The Nursing Clinics of North America: Clinical Genetics (2000) Editors Sharon Olsen, Lynn Baxendale-Cox, Victoria Mock	W.B. Saunders Company	The basics of genetics and genetic health care for the practice of every nurse and specialist
Cancer Care: A Guide for Oncology Nurses (2002) By Dale Lea, Kathleen Calzone, Agnes Masny, Annette Parry Bush	Oncology Nursing Press	A tool kit to assist the nurse in becoming competent in cancer genetics

Genome Research Resources

Resource	Contact	Description
BLAST	http://www.ensembl.org/Data/blast.html	Searches of protein or DNA sequence against metazoan genomes
Cancer Genome Anatomy Project	http://cgap.nci.nih.gov	Access to all CGAP data and biological resources
Chromosomal Variation in Man	http://www.wiley.com/legacy/products/subject/life/borgaonkar/	A catalog of chromosomal variants and anomalies

Ensembl	http://www.ensembl.org	Access to DNA and protein sequences with automatic baseline annotation
Human genome maps	http://genome.wustl.edu/projects/human/index.php	Links to clone and accession maps of the human genome
National Center for Biotechnology Information	http://www.ncbi.nlm.nih.gov/genome/guide/	Views of chromosomes, maps, and loci; links to other NCBI resources
Oak Ridge Genome Channel	http://compbio.ornl.gov/channel/	Java viewers for human genome data
Online Mendelian Inheritance in Man (OMIM)	http://www.ncbi.nlm.nih.gov/Omim/	Information about human genes and disease
The SNP Consortium	http://snp.cshl.org/	A variety of ways to query for SNPs in the human genome
UCSC Genome Bioinformatics	http://genome.cse.ucsc.edu/	Reference sequence for the human and C. elegans genomes and working drafts for the mouse, rat, Fugu, Drosophila, C. briggsae, Yeast, and SARS genomes.

Appendix B:

Meeting Participant List

Badzek, Laurie	American Nurses Association (ANA)
Beauchesne, Michelle	National Organization of Nurse Practitioner Faculties
Bickford, Carol	American Nurses Association (ANA)
Calzone, Kathleen, A.	International Society of Nurses in Genetics (ISONG) National Cancer Institute/NIH
Cashion, Ann, King	Un. of TN Health Science Center
Chornick, Nancy	National Council of State Boards of Nursing
Debisette, Annette, Tyree	DHHS/HRSA/BHP/OAA
Feetham, Suzanne	DHHS/HRSA/Center for Quality
Fete, Mary	Dermatology Nurses Association
Geolot, Denise, H.	DHHS/HRSA/BHP/DN
Goolsby, Mary Jo	American Academy of Nurse Practitioners
Greco, Karen, Elaine	Oregon Health & Science University
Hagan, Pam	American Nurses Association (ANA)
Hess, Madeleine	DHHS/HRSA/BHP/Gec
Hickey, Joanne	American Nurses Credentialing Center (ANCC)
Jenkins, Jean, F.	NHGRI/NIH
Jungquist, Carla	American Society for Pain Management Nursing (ASPMN)
Kenner, Carole, A.	National Association of Neonatal Nurses
Kirk, Maggie	University of Glamorgan NMS National Genetics Education and Development Centre
Lea, Dale, Halsey	NHGRI/NIH
Lewis, Judith, A.	Virginia Commonwealth University
Littlejohn, Sandra	National Alaska Native American Indian Nurses Assoc.
Malloy, Pam	American Association of Colleges of Nursing (AACN)
Masny, Agnes	Oncology Nursing Society (ONS)
Messmer, Patricia, R.	NLNAC & Miami Children's Hospital
Moore, Mary, Kay	Developmental Disabilities Nurses Association
Mott, Sandra	Society of Pediatric Nurses
Nessler, Kerry, Paige	DHHS/HRSA/BHP
Olsen, Sharon	The Johns Hopkins University School of Nursing/SREB
Picard, Carol	Sigma Theta Tau International
Potempa, Kathleen	Oregon Health and Science University
Prows, Cynthia, A.	Children's Hospital Medical Center
Puetz, Belinda, E.	National Nursing Staff Development Organization
Ramirez, Carmen, T.	National Association Hispanic Nurses
Repta, Shirley	American Psychiatric Nurses Association
Rivera, Reynaldo,	Philippine Nurses Association of America
Ruhl, Catherine,	Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN)
Rust, Jo Ellen	National Association of Clinical Nurse Specialists
Ryan-Kraus, Patricia	National Association of Pediatric Nurse Practitioners (NAPNAP)
Scales, Rosemary	Pediatric Endocrinology Nursing Society
Schiefelbein, Julieanne	The Academy of Neonatal Nursing
Schumann, Mary Jean	American Nurses Association (ANA)
Shaver, Joan	American Academy of Nursing
Shinn, Linda, J.	Consensus Management Group
Thomson, Elizabeth	NHGRI/NIH/ELSI Research
Tinkle, Melinda	National Institute for Nursing Research (NLN)
Valiga, Theresa, M.	National League for Nursing
Wicks, Terry, C.	American Association of Nurse Anesthetists
Williams, Charlene	American Academy of Ambulatory Care Nursing (AAACN)
Williams, Janet, K.	University of Iowa
Yeo, Seonae	Asian American/Pacific Islander Nurses Association